

What is claimed is:

1 1. A divider of a higher-radix type for obtaining a
2 quotient by referring to a divisor and a dividend normalized
3 respectively so as to satisfy a range of $1/2^k$ or more and less
4 than $1/2^{k+1}$ (k being a positive integer), and to a length of bits
5 defined by a radix for operations and a maximum number of digits
6 in all bits of a partial remainder, comprising:
7 a scaling factor generating section to generate a
8 multiplication factor used for performing a scaling so that said
9 divisor falls within a specified range;
10 a multiplying section to multiply each of said divisor and
11 said dividend by said multiplication factor;
12 a divisor tripled-number generating section to generate a
13 tripled number of said divisor which has been multiplied by the
14 multiplication factor;
15 a repetitive operating section to do division repeatedly by
16 using said divisor and said dividend which has been multiplied
17 by the multiplication factor and said tripled number of said
18 divisor; and
19 wherein said repetitive operating section produces a
20 quotient by generating high-order bits of 4-bit partial remainder
21 represented in a two's complement notation by referring to a number
22 of high-order bits, with an arbitrary length, of said partial
23 remainder and by referring to high-order 4 bits of said partial
24 remainder.

1 2. The divisor according to Claim 1, wherein said scaling
2 factor generating section generates said multiplication factor
3 so that said divisor falls within a range of $5/3 \times 1/2^k$ or more

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4 and less than $3/4 \times 1/2^k$.

1 3. A divider of a higher-radix type for obtaining a
2 quotient by referring to a divisor and a dividend normalized
3 respectively so as to satisfy a range of $1/2^k$ or more and less
4 than $1/2^{k+1}$ (k being a positive integer), and to a length of bits
5 defined by a radix for operations and a maximum number of digits
6 in all bits of a partial remainder, comprising:

7 a scaling factor generator to generate a multiplication
8 factor used for performing a scaling so that said divisor falls
9 within a specified range;

10 a multiplier to multiply each of said divisor and said
11 dividend by said multiplication factor;

12 a divisor tripled-number generator to generate a tripled
13 number of said divisor which has been multiplied by the
14 multiplication factor;

15 a repetitive calculator to do division repeatedly by using
16 said divisor and said dividend which has been multiplied by the
17 multiplication factor and said tripled number of said divisor;
18 and

19 wherein said repetitive calculator produces a quotient
20 by generating high-order bits of 4-bit partial remainder
21 represented in a two's complement notation by referring to a number
22 of high-order bits, with an arbitrary length, of said partial
23 remainder and by referring to high-order 4 bits of said partial
24 remainder.

1 4. The divisor according to Claim 1, wherein said scaling
2 factor generator generates said multiplication factor so that
3 said divisor falls within a range of $5/3 \times 1/2^k$ or more and less

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4 than $3/4 \times 1/2^k$.

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